

# Claims

[c1] What is claimed is:

1.A method of variable hot start for initiating a welding-type process comprising the steps of:  
determining at least one of a plurality of parameters of a welding-type device including a desired voltage/amperage (V/A) output for a welding-type process;  
selecting a startup V/A output greater than the desired V/A output based on the desired V/A output;  
selecting a duration of a hot start period based on the at least one of a plurality of parameters; and  
hot starting the welding-type process over the selected duration of the hot start period.

[c2] 2.The method of claim 1 further comprising the steps of selecting a taper period based on the at least one of a plurality of parameters and tapering the startup V/A output to the desired V/A output over the taper period.

[c3] 3.The method of claim 2 further comprising the steps of selecting the taper period to be substantially equivalent to the selected duration of the hot start period.

[c4] 4.The method of claim 2 further comprising the steps of

selecting the taper period based on the desired V/A output.

- [c5] 5.The method of claim 4 further comprising the step of selecting the taper period to be approximately 250 milliseconds (ms) if the desired V/A output is substantially less than approximately 1/3 of maximum V/A.
- [c6] 6.The method of claim 4 further comprising the step of selecting the taper period to be approximately 500 ms if the desired V/A output is substantially greater than approximately 1/3 of maximum V/A.
- [c7] 7.The method of claim 1 further comprising the step of selecting the startup V/A to be approximately three times the desired V/A output.
- [c8] 8.The method of claim 1 further comprising the steps of determining a selected stick type and adjusting the startup V/A output according to the selected stick type.
- [c9] 9.The method of claim 8 further comprising the step of setting the startup V/A output is boosted by approximately 300% if the selected stick-type is XX10.
- [c10] 10.The method of claim 8 further comprising the step of setting the startup V/A output is boosted by approximately 300% if the selected stick-type is XX18.

- [c11] 11.The method of claim 1 wherein the welding-type process includes a stick welding-type process.
- [c12] 12.The method of claim 1 further comprising the step of determining at least one of desired output polarity, desired process output, desired voltage output, desired amperage output, and electrode type and adjusting the startup V/A output according to the at least one pre-start condition.
- [c13] 13.The method of claim 1 further comprising the step of receiving feedback regarding a variable startup process and dynamically adjusting the startup V/A output.
- [c14] 14.A computer readable storage medium having stored thereon a computer program comprising instructions which, when executed by at least one processor, cause the at least one processor to:  
determine at least one pre-start condition of a welding-type apparatus including a desired V/A characteristic;  
select hot start parameters according to the at least one pre-start condition including a taper period based on the desired V/A characteristic;  
select a delivered V/A characteristic above the desired V/A characteristic; and  
start a welding-type process according to the hot start

parameters including tapering the delivered V/A characteristic to the desired V/A characteristic over the taper period.

- [c15] 15.The computer program of claim 14 wherein the processor is further caused to select the delivered V/A characteristic to be approximately three times the desired V/A characteristic and select the taper period to be approximately 250 milliseconds (ms) if the desired V/A characteristic is below approximately 1/3 of maximum V/A.
- [c16] 16.The computer program of claim 14 wherein the processor is further caused to select the delivered V/A characteristic to be approximately three times the desired V/A characteristic and select the taper period to be approximately 500 milliseconds (ms) if the desired V/A characteristic is above approximately 1/3 of maximum V/A.
- [c17] 17.The computer program of claim 14 wherein the processor is further caused to receive feedback regarding the step of starting the welding-type process and dynamically adjust the hot start parameters.
- [c18] 18.The computer program of claim 14 wherein the processor is further caused to determine at least one of de-

sired output polarity, desired process output, desired voltage output, desired amperage output, and electrode type to determine the at least one pre-start condition.

- [c19] 19.The computer program of claim 14 wherein the processor is further caused to control an arc start amperage, an arc start voltage, and an arc start duration according to the hot start parameters to start the welding-type process.
- [c20] 20.The computer program of claim 14 wherein the processor is further caused to determine at least one electrode parameter and set the delivered V/A characteristic according to the at least one electrode parameter.
- [c21] 21.The computer program of claim 20 wherein the processor is further caused to increase the delivered V/A characteristic by approximately 300% if the at least one electrode parameter is XX10.
- [c22] 22.The computer program of claim 20 wherein the processor is further caused to increase the delivered V/A characteristic by approximately 300% if the at least one electrode parameter is XX18.
- [c23] 23.A welding-type apparatus comprising:  
a power source configured to deliver welding-type power according to a desired welding-type process; and

a controller configured to control a variable hot start process to initiate the desired welding-type process, wherein the controller is configured to:

- receive an indication of a desired operational V/A output for the desired welding-type process;
- select a startup V/A output greater than the desired V/A output at least based on the desired operational V/A output;
- select a hot start period at least based on the desired operational V/A output;
- deliver the startup V/A output to initiate the desired welding-type process; and
- reduce the startup V/A output to the desired operational V/A output over the hot start period.

[c24] 24.The apparatus of claim 23 wherein the controller is further configured to select the startup V/A output to be approximately three times the desired operational V/A output.

[c25] 25.The apparatus of claim 23 wherein the controller is further configured to select a taper period and taper the startup V/A output to reduce the startup V/A to the operational V/A output over the taper period.

[c26] 26.The apparatus of claim 25 wherein the controller is further configured to select the taper period to be ap-

proximately 250 ms if the operational V/A output is less than approximately 1/3 of maximum V/A.

[c27] 27.The apparatus of claim 25 wherein the controller is further configured to select the taper period to be approximately 500 ms if the operational V/A output is greater than approximately 1/3 of maximum V/A.

[c28] 28.The apparatus of claim 23 wherein the controller is further configured to determine a selected stick type and adjust the startup V/A output according to the selected stick type.

[c29] 29.A welding-type apparatus comprising:  
means for determining a user selected V/A output for a desired welding-type process;  
means for boosting a starting V/A output above the user selected V/A output;  
means for selecting a time period based upon the user selected V/A output; and  
means for delivering a variable hot start by providing the starting V/A output to an output of the welding-type apparatus and then reducing the starting V/A output to the user selected V/A output over the time period.

[c30] 30.The welding-type apparatus of claim 29 wherein the starting V/A output is approximately three times the

user selected V/A output and the time period is approximately 250 milliseconds (ms) if the user selected V/A output is below approximately  $1/3$  of maximum V/A.

[c31] 31. The welding-type apparatus of claim 29 wherein the starting V/A output is approximately three times the user selected V/A output and the time period is approximately 500 milliseconds (ms) if the user selected V/A output is above approximately  $1/3$  of maximum V/A.

[c32] 32. The welding-type apparatus of claim 29 further comprising means for adjusting the starting V/A output according to a selected welding-type electrode.

[c33] 33. The welding-type apparatus of claim 29 further comprising means for dynamically adjusting the starting V/A output and the user selected V/A output according to user input during the time period.